

T H E B E L L S Y S T E M

Technical Journal

DEVOTED TO THE SCIENTIFIC AND ENGINEERING
ASPECTS OF ELECTRICAL COMMUNICATION

ADVISORY BOARD

A. B. GOETZE	M. J. KELLY
E. J. MCNEELY	

EDITORIAL COMMITTEE

B. McMillan, <i>Chairman</i>	K. E. GOULD
S. E. BRILLHART	E. I. GREEN
A. J. BUSCH	R. K. HONAMAN
L. R. COOK	H. R. HUNTLEY
A. C. DICKIESON	F. R. LACK
R. L. DIETZOLD	J. R. PIERCE

EDITORIAL STAFF

W. D. BULLOCH, <i>Editor</i>	R. L. SHEPHERD, <i>Production Editor</i>
------------------------------	--

INDEX

VOLUME XXXVI

1957

AMERICAN TELEPHONE AND TELEGRAPH COMPANY
NEW YORK

LIST OF ISSUES IN VOLUME XXXVI

	Pages
No. 1 January.....	1-348
" 2 March.....	349-592
" 3 May.....	593-830
" 4 July.....	831-1046
" 5 September.....	1047-1318
" 6 November.....	1319-1514

Index to Volume XXXVI

A

AF *See* United States Air Force
Activation of Electrical Contacts by Organic Vapors (L. H. Germer, J. L. Smith) 769-812
Agamemnon (cable ship) 303
AIR FORCE *See* United States Air Force
ALASKAN TELEPHONE CABLE 168
Alignment *See* Misalignment
ALLENTOWN PLANT (WESTERN ELECTRIC) 107, 123-25
ALTERNATOR SET
 two-motor carrier, L-type 140
AMERICAN TELEPHONE AND TELEGRAPH COMPANY 3, 14-15
AMPLITUDE MODULATION
 data transmission systems 1451-86
AMSTERDAM, HOLLAND 9
ANALYSIS
 combinatorial, error correcting coding 517-35
Angell, Miss D. T. 1033
ANGLE(s)
 measurement
 vernier resolver 1487-1500
ANGLO-IRISH CABLE 179
Anson, H. W. 1093
ANTENNA
 radio transmission
 beyond the horizon 639-40
 diagrams 599
 height 597;
 transmission loss 593-97
ARMOR, repeaters, transatlantic telephone cable 58
ARRAY *See* Memory Arrays
ATLANTIC CABLE 1-2, 4, 303
ATLANTIC OCEAN
 Mid-Atlantic Ridge 1066-68
 North Atlantic, *see* North Atlantic Ocean
 physiographic diagram inside rear cover Sept.

ATMOSPHERE, dielectric constant 603, 627
ATTENUATION
 Newfoundland-Nova Scotia link 221-23
 nonlinear, FM signal 879-89
 waveguide coupling 392
Aulock, Wilhelm von
 biographical material 591
Measurement of Dielectric and Magnetic Properties of Ferromagnetic Materials at Microwave Frequencies 427-48
AZORES map 8, 294, 296

B

BOD TEST *See* Test: biochemical oxygen demand
BSTJ *See* Bell System Technical Journal
BACTERIA 1097-1127
Baldwin, J. A. 1337
Bampton, J. F.
 biographical material 338
System Design for the Newfoundland-Nova Scotia Link 217-44
BANDWIDTH
 transatlantic telephone cable
 North Atlantic link 34-35
BATTERY *See* Storage Battery
BEAM *See* Electron Beam
Bechofer, R. E. 576
BELL SYSTEM TECHNICAL JOURNAL
 advisory board, *see* inside front covers
 Bulloch, W. D., editor 710
 editorial committee, *see* inside front covers
 editorial staff, *see* inside front covers
BELL TELEPHONE LABORATORIES 4, 57-58, 163
Bellows, B. C., Jr.
 biographical material 1511
Experimental Transversal Equalizer for TD-2 Radio Relay System 1429-50

- Beneš, Vaclav E.
biographical material 1045
Fluctuations of Telephone Traffic 965-73
Sufficient Set of Statistics for a Telephone Exchange Model 939-64
- BERNE, SWITZERLAND 9
- Binary Block Coding* (S. P. Lloyd) 517-35
- BINARY DIGIT *See* Bit
- BINOMIAL PROCESSES 537-76
- BIOCHEMICAL OXYGEN DEMAND TEST
See Test
- Biskeborn, M. C.
biographical material 338
Cable Design and Manufacture for the Transatlantic Submarine Cable System 189-216, 496
- BIT (BINARY DIGIT)
AM leased-line transmission 1451-86
twistor devices 1336
- Bleicher, E. 576
- BLOCK CODING *See* Code
- Bobeck, Andrew H.
biographical material 1511
New Storage Element Suitable for Large Sized Memory Arrays—the Twistor 1319-40
- Bobis, S. 1449
- BORER(S), marine 194
- BOSTON map 8
- Boyd, Richard C.
biographical material 588
New Carrier System for Rural Service 349-90
- Boyett, H. 426
- Braga, F. J.
biographical material 338
Repeater Design for the North Atlantic Link 69-101
- Bridgers, H. E. 1004
- BRITISH POST OFFICE, submarine cables, 3-5, 14-15, 57-58, 245
- Brockbank, R. A.
biographical material 339
Repeater Design for the Newfoundland-Nova Scotia Link 245-76
- BRUSSELS 9
- Buckley, O. E. 67
- BUILDINGS, radio transmission and 613-14
- Bullington, Kenneth
biographical material 828
Radio Propagation Fundamentals 593-626
- Bulloch, W. D., B.S.T.J. editor 710
- Burke, P. J. 964
- C**
- C.C.I.F. *See* International Consultative Committee on Telephony
- CABLE(S)
Alaska telephone, *see* Alaskan Telephone Cable
Anglo-Irish, *see* Anglo-Irish Cable
Hawaii telephone, *see* Hawaiian Telephone Cable
short-circuits, Poisson patterns 1005-33
submarine, *see* Submarine Cable
transatlantic telegraph (1866), *see* Atlantic Cable
transatlantic telephone, *see* Transatlantic Telephone Cable
trunks, *see* Trunk
- Cable Design and Manufacture for the Transatlantic Submarine Cable System* (M. C. Biskeborn, H. C. Fischer, A. W. Lebert) 189-216, 496
- CABLE LAYING 13
dynamics 1129-1207
kinematics 1129-1207
laying effect 43-44
methods, early 303
oceanography 1049
strains 13-14
transatlantic telephone cable 293-326
- CABOT STRAIT 3
- CANADIAN COMSTOCK CO., LTD. 244
- CANADIAN OVERSEAS TELECOMMUNICATION CORPORATION 3, 7, 244
- CAPACITANCE
geometries, pressure coefficients 485-95
submarine cables 485
- CAPACITOR
carrier, P1 367-68
mica, repeater, flexible, North Atlantic link 125-26
parallel plate
capacitance, pressure coefficients 485-95

- CARBON
activating
contacts, electrical 760-812
- CARRIER(s)
history 350
L-type
alternator set 140
P1 349-90
capacitors 367-68
channels 357-59
compandors 357
dialing 361-62
equipment arrangements 369-76
filters 365-66
inductors 366-67
installation 380-90
maintenance 375
miniaturization 370
networks 369
parameters 351-65
power supply 376-80
printed circuitry 371
repeaters 362-65, 373-75
ringing 359-61
signaling 359
terminals
block diagram 354
mounting 373-75
testing 375
transformers 368-69
transistors 349-90
transmission plan 351-55
trunks 350
- CASTING RESINS
BOD test 1099
marine conditions 1095-1127
- CATALINA ISLAND 13
- CENTRAL OFFICE, service range 350
- Chaffee, J. G. 1449
- CHANNEL(s)
carrier, P1 357-59
human, information rate, reading rates
and 497-516
noisy, error correction codes 1341-88
North Atlantic link 38
- Character of Waveguide Modes in Gyromagnetic Media* (H. Seidel) 409-26
- Circular Electric Wave Transmission in a Dielectric-Coated Waveguide* (H.-G. Unger) 1253-78
- Circular Electric Wave Transmission through Serpentine Bends* (H.-G. Unger) 1279-92
- CIRCULAR WAVEGUIDE *See* Waveguide
- CIRCUIT *See* subhead circuit under names of specific equipment and apparatus, e.g. Repeater; flexible; North Atlantic link; circuit; *Also see* Printed Circuitry; Short Circuit
- CLAPP, WILLIAM F., LABORATORIES 1115-21
- CLARENVILLE, NEWFOUNDLAND 2, 9, 29, 49, 57, 140, 145, 147, 150, 164-65, 217, 219, 221, 246, 248, 293, 301, 317-18, 323; *map* 8, 218, 300
- CLARENVILLE-OBAN LINK *See* North Atlantic Link
- CLARENVILLE-SYDNEY MINES LINK *See* Newfoundland-Nova Scotia Link
- CLIFTON PRECISION PRODUCTS COMPANY 1494, 1499
- CODE(s), CODING
block, binary 517-35
error correcting 517-35
binary, non 1341-88
geometric concept 1343-44
non-binary 1341-88
purpose 1341-43
Reed-Muller 1341
- Coincidences in Poisson Patterns* (E. N. Gilbert, H. O. Pollak) 1005-33
- Cold Cathode Gas Tubes for Telephone Switching Systems* (M. A. Townsend) 755-68
- COMBINATORIAL ANALYSIS
error correcting coding 517-35
- COMMUNICATION
channel, *see* Channel
- CONNECTION, shortest, network 1389-1401
- COMPANDING
improvement 671, 688-90
instantaneous
signals, quantized 653-709
carrier, P1 357
- COMPANY, TELEPHONE *See* Operating Companies
- CONDUIT
metal, testing 737-54
round, strength requirements 737-54

- CONDUIT (Cont.)**
- underground
 - clay, vitrified 737
 - loads 737
 - metal, testing 737-54
 - round
 - strength requirements 742-54
 - CONSOL (navigation system) 1050
 - CONTACT(S)**
 - relay
 - arcing 769-812
 - erosion, by vapors 769-812
 - CONTINENTAL SHELF, North Atlantic Ocean 1063-64
 - Cook, Madeline L. 1126
 - COOPERATION *See* International Cooperation
 - COPENHAGEN 9
 - COPPER TUBING
 - repeater, flexible, North Atlantic link 114-15
 - CORONA
 - power supply, transatlantic telephone cable 159
 - COUPLED-WAVE TRANSDUCER *See* Transducer
 - COUPLER, waveguide
 - attenuation 392
 - design 394-401
 - Crawford, Arthur B.
 - biographical material 828
 - Reflection Theory for Propagation beyond the Horizon* 627-44
 - CROSSTALK, transatlantic telephone cable 161, 230, 243
 - CRYSTAL
 - ferrites, *see* Ferrite
 - quartz
 - repeater, flexible, North Atlantic link 120-23
 - CUBA 13
 - Curtis, Harold E. 889
 - biographical material 828
 - Interchannel Interference due to Klystron Pulling* 645-52
 - D**
 - DC *See* Direct Current
 - Dagnall, C. H. 1449
 - DATA TRANSMISSION**
 - AM systems 1451-86
 - error correcting codes, non-binary 1341-88
 - leased-line services, transmission aspects 1451-86
 - mutilation 1342
 - Dawson, Robert W.
 - biographical material 588
 - Experimental Dual Polarization Antenna Feed for Three Radio Relay Bands* 391-408
 - DAYTONA BEACH, FLORIDA, test site 1115-21
 - DECCA NAVIGATOR 1050
 - DECODER, error correcting codes, non-binary 1341-88
 - DeCoste, J. B. 1126
 - DEFENSE WORK *See* Military Communications
 - De Hoff, Barbara 448
 - Depew, C. 768
 - Design, Performance and Application of the Vernier Resolver* (G. Kronacher) 1487-1500
 - Desoer, Charles A. 156-58
 - biographical material 1511
 - Network Containing a Periodically Operated Switch Solved by Successive Approximations* 1403-28
 - Determination of Pressure Coefficients of Capacitance for Certain Geometries (D. W. McCall) 485-95
 - DIAL TELEPHONE, DIALING
 - cable, *see* Cable
 - carrier, *see* Carrier
 - channels, *see* Channel
 - circuit
 - data transmission services 1451-86
 - companies, *see* Operating Companies
 - exchange, *see* Telephone Exchange
 - leased-lines, *see* Leased-Line Services
 - repeaters, *see* Repeater
 - rural, *see* Rural Telephone Service
 - telephone exchange, *see* Telephone Exchange
 - traffic, *see* Traffic
 - transmission, *see* Transmission
 - trunks, *see* Trunk

- DIELECTRIC, inhomogeneous, waveguide, circular, curved 1209-51
DIELECTRIC-COATED WAVEGUIDE *See* Waveguide
DIELECTRIC CONSTANT capacitance, pressure coefficients 485
DIGIT, binary *See* Bit
DIRECT CURRENT transatlantic telephone cable 139-62
DISTORTION FM signal, noise modulated 879-89
TD-2 radio relay system 1429-50
Distortion Produced in a Noise Modulated FM Signal by Non-Linear Attenuation and Phase Shift (S. O. Rice) 879-98
Doba, S. 889
Dynamics and Kinematics of the Laying and Recovery of Submarine Cable (E. E. Zajac) 1129-1207
- E**
- E.P.I. (electronic position indicator) 1050
EARTHQUAKES, ocean bottom 1086-88
EASTERN TELEPHONE AND TELEGRAPH COMPANY 7, 244
Ebbe Grace L. 1449
ECHO, transatlantic telephone cable 21
ECHO SOUNDING 1051-52, 1055
EFFICIENCY electron tubes, transatlantic telephone cable 3
ELASTOMER(S) BOD test 1099
marine conditions 1905-1127
ELECTRIC WAVE *See* Wave
ELECTRICAL ATTENUATION *See* Attenuation
ELECTRICAL CAPACITANCE *See* Capacitance
ELECTRICAL CAPACITOR *See* Capacitor
ELECTRICAL CONTACTS *See* Contact
ELECTRICAL DISTORTION *See* Distortion
ELECTRICAL FILTERS *See* Filter
ELECTRICAL INDUCTOR *See* Inductor
ELECTRICAL INTERFERENCE *See* Interference
ELECTRICAL LOADING *See* Loading
- ELECTRICAL LOSS *See* Net Loss; Transmission Loss
ELECTRICAL NETWORK *See* Network
ELECTRICAL NOISE *See* Noise
ELECTRICAL TRANSFORMER *See* Transformer
Electrically Operated Hydraulic Control Valve (J. W. Schaefer) 711-36
ELECTRON BEAM (in) magnetic field, longitudinal noise spectrum 831-78
growing noise 831-53
UHF 855-78
noise, electron beam, relation 832
Pierce-type, noise 833
ELECTRON TUBE 6P10 179-80; *illus* 165
6P12 180-88
electrical characteristics 184-86
lifetime 185-86
tests 186-88
175HQ 163-79
cathode assembly *illus* 169
electrical characteristics 171-77
fabrication 177-78
heater *illus* 169
mechanical features 168-78
reliability 178
selection 177-78
SP61 179-80
gas diode
by-pass 88-90; *illus* 89
gas discharge
characteristics 755-65
switching systems 755-68
submarine cables, performance requirements 163-88
traveling-wave, noise 831
See also Klystron Pulling
Electron Tubes for the Transatlantic Cable System (M. F. Holmes, J. O. McNally, G. H. Metson, E. A. Veazie) 163-88
ELECTRONIC POSITION INDICATOR 1050
Elmendorf, C. H.
biographical material 1317
Oceanographic Information for Engineering Submarine Cable Systems 1047-93

- Emling, J. W.**
biographical material 339
Translantic Telephone Cable System—Planning and Over-All Performance
7-27
- ENCODER**, error correcting codes, non-binary 1341-88
- ENGINEERING**, traffic 940
- ENGLAND map** 294, 296
- EQUALIZER(s)**
repeater, flexible
North Atlantic link 99-100
shore
transatlantic telephone cable 46-49
transverse
TD-2 radio relay system 1429-50
- EQUIPMENT MINIATURIZATION** *See* Miniaturization
- ERROR CORRECTING CODES** *See* Code
- Ewing, Maurice** 1093
- Experimental Dual Polarization Antenna Feed for Three Radio Relay Bands* (R. W. Dawson) 391-408
- Experimental Transversal Equalizer for TD-2 Radio Relay System* (B. C. Bellows, Jr., R. S. Graham) 1429-50
- F**
- 4B TRANSISTOR** *See* Transistor
- 5B TRANSISTOR** *See* Transistor
- FM** *See* Frequency Modulation
- FADING**, radio transmission 600-01
- Fedukowicz, W.** 1093
- Feher, George**
biographical material 588
Sensitivity Considerations in Microwave Paramagnetic Resonance Absorption Techniques 449-84
- FERRITE**
microwave region, dielectric properties, measurement 427-48
parameters 428-30
- FERRITE LOADED WAVEGUIDE** *See* Waveguide
- FERROMAGNETIC MATERIALS** *See* Ferrite
- Field, Cyrus** 293
- FIELD** *See* Magnetic Field
- FILTER(s), carrier, P1** 365-66
- Fischer, H. C.**
biographical material 339
Cable Design and Manufacture for the Transatlantic Submarine Cable System 189-216, 496
- Fletcher, R. C.** 426, 483, 1337
Fluctuations of Telephone Traffic (V. E. Beneš) 965-73
- FOG**, and radio transmission 602
- Foster, H.** 1093
- FRANCE map** 294, 296
- FRANKFURT, Germany** 9
- Fraser, John M.**
biographical material 340
System Design for the North Atlantic Link 29-68
- FREQUENCY**, transatlantic telephone cable 18, 24-26
- FREQUENCY MODULATION**
interference, interchannel
klystron pulling 645-52
- FRESNEL ZONES** 597-99
- Friis, Harald T.**
biographical material 828
Reflection Theory for Propagation beyond the Horizon 627-44
- G**
- GAS DIODE TUBE** *See* Electron Tube
- GAS DISCHARGE TUBE** *See* Electron Tube
- GEIGER COUNTERS**, Poisson patterns 1005-33
- GENERALIZED TELEGRAPHIST'S EQUATIONS**
waveguide, circular, curved
dielectric, inhomogeneous 1209-51
- Gere, E.** 483
- Germer, Lester H.**
Activation of Electrical Contacts by Organic Vapors 769-812
biographical material 829
- Geschtwind, S.** 483
- Gibson, W. C.** 1126
- Gilbert, E. N.** 964
biographical material 1045
Coincidences in Poisson Patterns 1005-33
- Gilbert, J. J.** 67

- Glaser, J. L. 698
GLASGOW, Scotland 9
Gleichmann, T. F.
biographical material 340
Repeater Design for the North Atlantic Link 69-101
Graham, R. Sheils
biographical material 1511
Experimental Transversal Equalizer for TD-2 Radio Relay System 1429-50
Great Eastern (cable ship) 293, 303
GREENLAND map 8
Griffith, R. G.
biographical material 340
Transatlantic Telephone Cable System—Planning and Over-All Performance 7-27
Grismore, O. D. 495
GUIDE *See Waveguide*
GUIDED MISSILES *See Nike*
Gumley, R. H. 812
GUN *See Electron Gun*
Gupta, S. S. 576
- H**
- H.M.T.S. Monarch* *See Monarch*
Hagelbarger, D. W. 1033
Hale, A. L. 1093
Halsey, R. J.
biographical material 341
System Design for the Newfoundland-Nova Scotia Link 217-44
Transatlantic Telephone Cable System—Planning and Over-All Performance 7-27
Hamming, R. W. 535
HAWAIIAN TELEPHONE CABLE 168
HAWTHORNE WORKS (WESTERN ELECTRIC) 107
Heezen, Bruce C.
biographical material 1317
Oceanographic Information for Engineering Submarine Cable Systems 1047-93
Heffner, William W.
biographical material 341
Repeater Production for the North Atlantic Link 103-38
Heskett, H. E. 405
- High-Voltage Conductivity-Modulated Silicon Rectifier* (M. B. Prince, H. S. Veloric) 975-1004
- HILLSIDE PLANT (WESTERN ELECTRIC)** 103-38
- Hipkins, Renee 512
Hogg, David C.
biographical material 829
Reflection Theory for Propagation beyond the Horizon 627-44
Holdaway, V. L. 768
Holmes, M. F.
biographical material 341
Electron Tubes for the Transatlantic Cable System 163-88
Hoth, D. F. 698
Howard, John D.
biographical material 588
New Carrier System for Rural Service 349-90
Huyett, Marilyn J.
biographical material 589
Selecting the Best One of Several Binomial Populations 537-76
- HUMAN CHANNEL** *See Channel*
- I**
- ICELAND map 8
INDUCTOR
carrier, PI 366-67
repeater, flexible
North Atlantic link 127-29
- INFORMATION RATE**
channel, human 497-516
prose 501-04
reading rates 497-516
word length 500
vocabulary size 409
vocoder 497
- INFORMATION STORAGE**
twistor 1319-40
- INHOMOGENEOUS DIELECTRIC** *See Dielectric*
- INSPECTION**
repeater, flexible, transatlantic telephone cable 131-38
- INSTALLATION**
carrier, PI 380-90

- Instantaneous Companding of Quantized Signals* (B. Smith) 653-709
- INTEGRITY** (components) 31, 33
- Interchannel Interference due to Klystron Pulling* (H. E. Curtis, S. O. Rice) 645-52
- interchannel, frequency modulation
klystron pulling 645-52
power spectrum 647-48
- transatlantic telephone cable power supply 161
- INTERNATIONAL CONSULTATIVE COMMITTEE ON TELEPHONY**
standards 17
- INTERNATIONAL COOPERATION** 7-8,
14-15, 27, 246, 326
- IONOSPHERE**, radio transmission 618-23
- IOWA ENGINEERING EXPERIMENT STATION**
conduit, underground 737-54
- IRELAND** map 294, 296
- J**
- J-7 TRANSDUCER** See Transducer: electrohydraulic
- 'Jack, John S.
biographical material 341
- Route Selection and Cable Laying for the Transatlantic Cable System* 293-326
- Jacobs, O. B. 67
- Jensen, R. A. 1337
- Jervey, W. T. 754
- JUTE, in BOD test 1099
- K**
- Kankowski, Edward 448
- Kaplan, E. L. 576
- Karlin, John E.
biographical material 589
- Reading Rates and the Information Rate of a Human Channel* 497-516
- KEARNEY WORKS** (W. E. Co.) 103-38
- Kegelman, T. D. 1126
- Kelly, J. L. 512
- Kelly, Mervin J.
biographical material 342
- Transatlantic Communications—An Historical Resume* 1-5
- Kelly, R.
biographical material 342
- Power-Feed System for the Newfoundland-Nova Scotia Link* 277-92
- Kelvin, Lord 11, 293
- Kip, A. F. 483
- KLYSTRON PULLING**
interference, interchannel 645-52
- Kohman, G. T. 495
- Kronacher, Gerald
biographical material 1512
- Design, Performance and Application of the Vernier Resolver* 1487-1500
- L**
- L-TYPE CARRIER** See Carrier
- LABORATORIES** See Bell Telephone Laboratories
- Lamb, Harold A.
biographical material 342
- Repeater Production for the North Atlantic Link* 103-38
- Lawton, C. S. 1126
- LAYING** See Cable Laying
- Leach, Priscilla 1126
- LEASED-LINE SERVICES**
data transmission
transmission aspects 1451-86
network, shortest connection
1389-1401
- Lebert, Andrew W. 495
biographical material 343
- Cable Design and Manufacture for the Transatlantic Submarine Cable System* 189-216, 496
- Lee, C. Y. 1387
- Leech, W. H.
biographical material 343
- Route Selection and Cable Laying for the Transatlantic Cable System* 293-326
- Letham, D. L. 512
- Levenbach, G. J. 1004
- Lewis, Herbert A.
biographical material 343
- Route Selection and Cable Laying for the Transatlantic Cable System* 293-326
- System Design for the North Atlantic Link* 29-68

- Lewis, J. A. 495
LIFE EXPECTANCY
electron tube
 175HQ 166, 171-77
 6P12 185-86
transatlantic telephone cable
 North Atlantic link 66-67
LIMNORIA 1096-1127
Linee, Arthur H.
 biographical material 344
 Repeater Design for the North Atlantic Link 69-101
LINEAR PROGRAMMING
binomial processes 537-76
Lloyd, Stuart P. 964
 Binary Block Coding 517-35
 biographical material 589
LOADING
repeaters, submarine cable 20
LONDON 7-9; *map* 8
Looney, D. H. 1337
LORAC (navigation system) 1050
LOBAN (navigation system) 1050
Loss *See Net Loss; Transmission Loss*
Lovell, G. H.
 biographical material 344
 System Design for the North Atlantic Link 29-68
Lozier, J. C. 1499
Lutchko, F. R. 1004
Lutz, Mary 512
Lynch, A. C. 495
- M**
- McCall, D. W.
 biographical material 589
Determination of Pressure Coefficients of Capacitance for Certain Geometries 485-95
McClure, B. T. 768
McMillan, B. 698
McNally, J. O.
 biographical material 344
Electron Tubes for the Transatlantic Cable System 163-88
MAGDALENA RIVER
turbidity currents 1089-90
MAGNETIC WIRE *See Wire*
- MAINTENANCE**
carrier, P1 375
Newfoundland-Nova Scotia link
 235-41
 North Atlantic link 55-57
transatlantic telephone cable 21-23,
 55-57, 235-41
MARINE BORER(S)
test sites 1115-21
transatlantic telephone cable 194
MARINE NAVIGATION *See Navigation*
MARITIME PROVINCES OF CANADA 9
Measurement of Dielectric and Magnetic Properties of Ferromagnetic Materials at Microwave Frequencies (W. von Aulock, J. H. Rowen) 427-48
MEMORY ARRAYS
twistor 1319-40
Mertz, Pierre
 biographical material 1512
Transmission Aspects of Data Transmission Service Using Private Line Voice Telephone Channels 1451-86
Meszaros, George W.
 biographical material 345
Power Feed Equipment for the North Atlantic Link 139-62
METERING
current, transatlantic telephone cable 151-58
METHYL-METHACRYLATE *See Plexiglass*
Metson, G. H.
 biographical material 345
Electron Tubes for the Transatlantic Cable System 163-88
MICA CAPACITORS *See Capacitor*
Michaels, S. E. 512
MICROWAVE(S)
feed, polarization, dual 391-408
paramagnetic resonance techniques 449-84
MICROWAVE RELAY SYSTEMS *See Radio Relay Systems*
MID-ATLANTIC RIDGE 1066-68
MILITARY COMMUNICATIONS
Nike, electrohydraulic transducer 711-36
servomechanisms, hydraulic 736
Miller, S. E. 405

- MINIATURIZATION, carrier, P1 370
 MISALIGNMENT, transatlantic cable,
 North Atlantic link 42-46
 Mitchel, Duncan M. 754
 Mitchell, Doren
 biographical material 1512
Transmission Aspects of Data Transmission Service Using Private Line Voice Telephone Channels 1451-86
 MODE(s), normal, electric waves, circular 1292-1307
 MODULATION
 amplitude, *see* Amplitude Modulation
 frequency, *see* Frequency Modulation
 MODULATION
 transatlantic telephone cable
 North Atlantic link 63
 pulse
 amplitude (PAM) 655-57
 code (PCM) 655-57
 quantizing impairment 656-57
 duration (PDM) 655-57
 position (PPM) 655-57
 Monarch (cable ship) 162, 244, 250,
 303-26; *illus* 305
 cable gear line schematic 310
 MONOGRAPHS, recent, of Bell System
 technical papers not published in
 this Journal 335-37, 583-87; 823-27;
 1043-44; 1313-17; 1508-10
 Monro, S. 576
 MONTREAL 7-9; *map* 8
 Morgan, Samuel P.
 biographical material 1318
Theory of Curved Circular Waveguide Containing an Inhomogeneous Dielectric 1209-51
 Mottram, Elliott T.
 biographical material 345
Transatlantic Telephone Cable System—Planning and Over-All Performance
 7-27
 Murphy, R. B. 576
 MUTILATION (data transmission) 1342
- N**
- No. 4B TRANSISTOR *See* Transistor
 No. 5B TRANSISTOR *See* Transistor
- No. 6P10 ELECTRON TUBE *See* Electron Tube
 No. 6P12 TUBE *See* Electron Tube
 No. 7F TEST SET *See* Test Set
 No. 175HQ TUBE *See* Electron Tube
 No. SP61 TUBE *See* Electron Tube
 NANTUCKET 13
 NAVIGATION
 marine, systems table 1050
 NET LOSS
 transatlantic telephone cable 18
 NETWORK
 carrier, P1 369
 shortest connection 1389-1401
 construction principles 1391-94
 U. S. state capitals *illus* 1390
 switching, periodic 1403-28
Network Containing a Periodically Operated Switch Solved by Successive Approximations (C. A. Desoer)
 1403-28
 New Carrier System for Rural Service (R. C. Boyd, J. D. Howard, L. Pedersen)
 349-90
New Storage Element Suitable for Large Sized Memory Arrays—the Twistor (A. H. Bobeck) 1319-40
 NEW YORK CITY *map* 7-9, 11; 8
 NEWFOUNDLAND *map* 294, 296, 300
 NEWFOUNDLAND-NOVA SCOTIA LINK
 attenuation 221-23
 circuits 223
 crosstalk 230, 243
 design 217-44
 electron tubes 163-88, 179-88
 maintenance 235-41
 noise 229, 241-42
 power supply 225-27, 277-92
 repeaters 163-88, 245-76
 route selection 317-20
 terminals 227-29
 transmission loss 229, 241
 transmission objectives 217
 Niagara (cable ship) 303
 NIKE
 roll servo
 purpose 711
 simplified schematic 712
 transducer, electrohydraulic, J-7
 711-36

NOISE

- electron beam 831-78
- electron tube, traveling-wave 831
- error correction codes 1341-88
- Newfoundland-Nova Scotia Link 229, 241-42
- transatlantic telephone cable
 - North Atlantic link 39-42, 62-63
 - radio transmission 623-25

Noise Spectrum of Electron Beam in Longitudinal Magnetic Field: The Growing Noise Phenomenon; The UHF Noise Spectrum (W. W. Rigrod) 831-78

Non-Binary Error Correction Codes (W. Ulrich) 1341-88

NONLINEAR ATTENUATION *See Attenuation*

Normal Mode Bends for Circular Electric Waves (H.-G. Unger) 1292-1307

NORTH AMERICA *map* 294, 296

NORTH ATLANTIC LINK

- bandwidth 34-35
- cable current
 - regulation 143-45; *simplified schematic* 143-45
- channels 38
- description 29-31
- design 29-68
- electron tubes 163-78
- equalization
 - shore 46-49; *block schematics*
- inaccessibility 34
- integrity 33
- maintenance 55-57
- misalignment 42-46
- modulation 63
- noise 39-42, 62-63
- performance 59-65
- power feed, *see* Power Supply
- repeaters, *see* Repeater
- schematic diagram* 30
- signal-to-noise design 35
- spares 65-66
- terminals 52-55
- testing 55-59

NORTH ATLANTIC OCEAN

- basins 1064-65
- bottom 1072-74

- temperature 1077-86
- continental shelf 1063-64
- earthquake epicenters *map* 1087
- telegraph cables *map* 294
- topography 1061-70; *illus*

NORTH SEA 3

NORTHERN ELECTRIC COMPANY, LTD. 57, 244

NORTON, E. L. 736

NOVA SCOTIA *map* 294, 296

NOYCE, R. N. 1004

NUMBER 4B TRANSISTOR *See* Transistor

NUMBER 5B TRANSISTOR *See* Transistor

NUMBER 6P10 ELECTRON GLOBE *See* Electron Tube

NUMBER 6P12 TUBE *See* Electron Tube

NUMBER 7F TEST SET *See* Test Set

NUMBER 175HQ TUBE *See* Electron Tube

NUMBER SP61 TUBE *See* Electron Tube

O

175HQ TUBE *See* Electron Tube

OBAN, SCOTLAND 2, 9, 29, 49, 57, 140, 145, 147, 150, 164-65, 217, 219, 221, 246, 248, 293, 301, 317-18, 323; *map* 8, 218, 300

OCEAN BOTTOM

catastrophic changes 1086-93

knowledge, present 1070-74

sediment 1071

study 1048

evaluation 1056-1057

methods 1065-70; *illus*

presentation 1057-61

topography 1049-65

turbidity currents 1089-93

OCEAN CABLE *See* Submarine Cable

Oceanographic Information for Engineering Submarine Cable Systems (C. H. Elmendorf, B. C. Heezen) 1047-93

OCEANOGRAPHY, defined 1047-48

OFFICE *See* Central office

O'NEIL, H. T. 1033

OPERATING COMPANIES

carrier, Pt 350

ORDNANCE SURVEY OF GREAT BRITAIN 244

P

- P1 CARRIER *See Carrier*
 PAM *See Modulation: pulse; amplitude*
 PCM *See Modulation: pulse; code*
 PDM *See Modulation: pulse; duration*
 PPM *See Modulation: pulse; position*
 PARALLEL PLATE CAPACITORS *See Capacitor*
 PARAMAGNETIC RESONANCE
 absorption 450
 PARAMETER(S)
 carrier, P1 351-65
 ferrites 428-30
 PARIS 9
 Pauer, J. J. 754
 Pedersen, Ludwig
 biographical material 589
 New Carrier System for Rural Service
 349-90
 PERIODIC SWITCHING *See Switching*
 Perkins, E. H. 390
 PHASE SHIFT
 FM signal, noise modulated
 distortion 879-89
 PHOLADIDAE 1096-1127
 Pierce, John R.
 biographical material 590
 *Reading Rates and the Information Rate
 of a Human Channel* 497-516
 PIERCE-TYPE ELECTRON GUN *See Electron Gun*
 PLASTICS
 marine conditions 1095-1127
 PLEXIGLASS
 properties 115
 repeaters, flexible, North Atlantic
 link 115-16
 POISSON PATTERNS, coincidences
 1005-33
 Pollak, H. O.
 biographical material 1045
 Coincidences in Poisson Patterns
 1005-33
 POLYETHYLENE
 BOD test 1099
 submarine cable 189-93, 197, 199, 205
 POLYVINYL CHLORIDE, BOD test 1099
 POPULATIONS, binomial *See Binomial Processes*
- Portis, A. M. 483
 PORTLAND, MAINE *map* 8
 POST OFFICE *See British Post Office*
 POWER, dc, reliability 140
 POWER-FEED *See Power Supply*
*Power Feed Equipment for the North
 Atlantic Link* (G. W. Meszaros, H.
 H. Spencer) 139-62
*Power-Feed System for the Newfoundland-
 Nova Scotia Link* (R. Kelly, J. F. P.
 Thomas) 277-92
 POWER SUPPLY
 carrier, P1 376-80
 Newfoundland-Nova Scotia link
 225-27, 277, 292
 transatlantic telephone cable
 crosstalk 161
 North Atlantic link 49-52, 139-62;
 schematic diagram 51
 equipment design 158-62
 standby sources 145-51
 Prim, R. C.
 biographical material 1512
 *Shortest Connection Networks and Some
 Generalizations* 1389-1401
 Prince, M. B.
 biographical material 1045
 *High-Voltage Conductivity-Modulated
 Silicon Rectifier* 975-1004
 PRINTED CIRCUITRY
 carrier, P1 371
 PRIVATE LINE SERVICES *See Leased-Line Services*
 PROBABILITIES, binomial processes
 537-76
 PROCESSES *See Binomial Processes*
 PROGRAMMING *See Linear Programming*
 PROPAGATION *See Transmission*
 PROSE, information rate 501-04
 PULSE MODULATION, quantized 655-57

Q

- QUALITY
 Bell System 103
 Western Electric 103
 QUANTIZED SIGNAL *See Signal*
 QUARTZ CRYSTAL *See Crystal*
 QUEBEC (city) *map* 8

R

- Radio Propagation Fundamentals* (K. Bullington) 593-626
- RADIO RELAY SYSTEMS**
- TD-2
 - distortion 1429-50
 - equalizer, transversal 1429-50
 - repeaters, equalizer, transversal 1429-50
 - RADIO TELEPHONE, transatlantic 5
 - RADIO TRANSMISSION LOSS** *See* Transmission Loss
 - RAIN, and radio transmission 602
 - Radley, Sir Gordon
 - biographical material 345
 - Transatlantic Communications—An Historical Resume* 1-5
 - RAYLEIGH DISTRIBUTION 600-01, 624
 - Reading Rates and the Information Rate of a Human Channel* (J. E. Karlin, J. R. Pierce) 497-516
 - RECTANGULAR WAVEGUIDE** *See* Waveguide
 - RECTIFIER**
 - silicon, conductivity-modulated high-voltage 975-1004
 - solid state
 - voltage 975
 - REED-MULLER CODES 1341
 - Reflection Theory for Propagation beyond the Horizon* (A. B. Crawford, H. T. Friis, D. C. Hogg) 627-44
 - REGENERATIVE REPEATER** *See* Repeater
 - REGULATOR**
 - current, transatlantic telephone cable 143-45
 - RELAY SYSTEMS** *See* Radio Relay Systems
 - RELIABILITY**
 - electron tube, 175HQ 178
 - REPEATER**
 - carrier, PI 362-65, 373-75
 - flexible
 - North Atlantic link 69-138
 - capacitors 125-26
 - circuit 71
 - components 81-88
 - container 90-94
 - coupling networks 73-76

- design 69-101
 - equalization 99-100
 - feedback loop 78-79
 - gain formula 72-73
 - gas diode tube 88-90; *illus* 89
 - inspection 131-38
 - manufacture 103-38
 - assembly 116-20
 - brazing 116-20
 - clothing, special 109
 - dust count 110
 - quartz crystals 120-23
 - mechanical design 79-81
 - packing 130
 - performance 96-98
 - power feed 139-62
 - production 110-14
 - raw materials 114-16
 - schematic diagram* 70
 - seals 90-94, 123-25; *illus* 118
 - shipping 130
 - subcontracted operations 107-08
 - testing 77-78, 94-96
- Newfoundland-Nova Scotia link 245-76
- regenerative, self-timing 891-937
- reliability 245
- submarine cable
 - British Post Office 12
 - loading 20
- TD-2 radio relay system
 - equalizer, transversal 1429-50
- transatlantic telephone cable
 - armoring 58
 - efficiency 2-3
 - electron tubes 2-4
 - specifications 2
- Repeater Design for the Newfoundland-Nova Scotia Link* (R. A. Brockbank, D. C. Walker, V. G. Welsby) 245-76
- Repeater Design for the North Atlantic Link* (F. J. Braga, T. F. Gleichmann, A. H. Lince, M. C. Wooley) 69-101
- Repeater Production for the North Atlantic Link* (W. W. Heffner, H. A. Lamb) 103-38
- RESIN(S)**
 - casting 1095-1127
 - BOD test 1099
 - marine conditions 1095-1127

- Resistance of Organic Materials and Cable Structures to Marine Biological Attack* (L. R. Snoke) 1095-1127
- RESISTOR**
repeater, flexible
North Atlantic link 126-27
- RESOLVER** *See* Synchro Resolver; Vernier Resolver
- RESONANCE** 450
See also Paramagnetic Resonance
- Rice, Stephen O. 698
biographical material 829, 1046
Distortion Produced in a Noise Modulated FM Signal by Non-Linear Attenuation and Phase Shift 879-89
- Interchannel Interference due to Klystron Pulling* 645-52
- Richards, A. P. 1126
- Rigrod, W. W.
biographical material 1046
Noise Spectrum of Electron Beam in Longitudinal Magnetic Field: The Growing Noise Phenomenon; The UHF Noise Spectrum 831-78
- Riordan, J. 964-65
- RINGING**
carrier, P1 359-61
- Rose, A. C. 1387
- ROUND WAVEGUIDE** *See* Waveguide: circular
- Route Selection and Cable Laying for the Transatlantic Cable System* (J. S. Jack, W. H. Leech, H. A. Lewis) 293-326
- Rowen, John H.
biographical material 590
Measurement of Dielectric and Magnetic Properties of Ferromagnetic Materials at Microwave Frequencies 427-48
- RURAL TELEPHONE SERVICE**
carrier, P1 349-90
- S**
- 6P10 ELECTRON TUBE** *See* Electron Tube
- 6P12 ELECTRON TUBE** *See* Electron Tube
- 6P12 TUBE** *See* Electron Tube
- 7F TEST SET** *See* Test Set
- SP61 TUBE** *See* Electron Tube
- Schaefer, J. W.
biographical material 830
- Electrically Operated Hydraulic Control Valve* 711-36
- SCOTLAND** map 294, 296
- SEA** *See* Ocean Bottom
- SEAL(s)**, repeater, flexible, North Atlantic link 90-94, 123-25; *illus* 118
- SEASONS**, transmission, radio, beyond the horizon 640-43
- SEDIMENT**, ocean bottom 1071
- Seidel, Harold
biographical material 590
Character of Waveguide Modes in Gyromagnetic Media 409-26
- Selecting the Best One of Several Binomial Populations* (Marilyn J. Huyett, M. Sobel) 537-76
- Self-Timing Regenerative Repeaters* (E. D. Sunde) 891-937
- SEMICONDUCTOR(s), SEMICONDUCTING MATERIALS** *See* Ferrite
- Sensitivity Considerations in Microwave Paramagnetic Resonance Absorption Techniques* (G. Feher) 449-84
- SERPENTINE WAVEGUIDE** *See* Waveguide: circular
- SERVICE** *See* Maintenance
- SERVO SYSTEMS**
electrohydraulic, Nike 711-36
hydraulic, military communications 736
power supply, transatlantic telephone cable 155-58
vernier resolver *illus* 1497
- SHORAN** (navigation system) 1050
- SHORT CIRCUIT**
cables, Poisson patterns 1005-33
- Shortest Connection Networks and Some Generalizations* (R. C. Prim) 1389-1401
- SIGNAL(s), SIGNALING**
binary, data transmission 1451-86
carrier, P1 359
companding, instantaneous 653-709
FM, noise modulated distortion 879-89
quantized, companding, error 665-76
instantaneous 653-709
spectrum 663
transatlantic telephone cable 20-21

- SIMPLEX WIRE AND CABLE COMPANY 196-97
Silsbee, R. H. 483
Silverman, S. J. 1004
Simonick, V. F. 736
Slepian D. 512
Slichter, C. P. 483
Smith, Bernard
biographical material 830
Instantaneous Companding of Quantized Signals 653-709
Smith, D. H. 390
Smith, James L.
Activation of Electrical Contacts by Organic Vapors 769-812
biographical material 830
Snoke, Lloyd R.
biographical material 1318
Resistance of Organic Materials and Cable Structures to Marine Biological Attack 1095-1127
Snow and radio transmission 602
Sobel, Milton
biographical material 590
Selecting the Best One of Several Binomial Populations 537-76
SOFAR (navigation system) 1050
SOLENOID electrohydraulic, J-7 711-36
SOUNDING, echo 1051-52, 1055
SOUTHERN UNITED TELEPHONE CO., LTD. 244
SPARE PARTS, North Atlantic link 65-66
Spencer, H. H.
biographical material 346
Power Feed Equipment for the North Atlantic Link 139-62
SPRUCE LAKE, NEW BRUNSWICK 11
ST. JOHN, NEW BRUNSWICK map 8
STANDARD TELEPHONES AND CABLES, LTD. 244, 274, 292
STATES (UNITED STATES), capitals, network, shortest connection 1389-1401; *illus.* 1390
STATISTICAL METHODS
telephone exchange model 939-64
traffic fluctuations 965-73
STORAGE BATTERY, as power source 140
STORAGE See Information Storage
Strength Requirements for Round Conduit (G. F. Weissmann) 737-54
- SUBMARINE CABLE(S)
background experience 11-15
British Post Office systems 12-13
capacitance 485
electron tubes 3
marine organism attack 1095-1127
North Atlantic link 33
oceanographic information 1047-93
recovery
dynamics 1129-1207
kinematics 1129-1207
research 5
stresses 1
transatlantic telephone, *see* Transatlantic Telephone Cable
transistors 3-4
United States 13-14
- SUBMARINE CABLES, LTD. 196-97, 274
Sufficient Set of Statistics for a Telephone Exchange Model (V. E. Beneš) 939-64
Sunde, Erling D. 889
biographical material 1046
Self-Timing Regenerative Repeaters 891-937
- SWITCHING periodic, network 1403-28
SWITCHING SYSTEMS
electron tubes, gas discharge 755-68
SWITCHING TIME twistor 1328
- SYNCHRO RESOLVER
accuracy 1487-88
See also Vernier Resolver
- SYDNEY MINES, NOVA SCOTIA 11, 29, 164-65, 219, 221, 232, 246, 248, 318, 321, 323; *map* 8, 218, 300
- System Design for the Newfoundland-Nova Scotia Link* (J. F. Bampton, R. J. Halsey) 217-44
- System Design for the North Atlantic Link* (J. M. Fraser, H. A. Lewis, G. H. Lovell, R. S. Tucker) 29-68
- T
- TD-2 RADIO RELAY SYSTEM *See* Radio Relay Systems
- TACAN (navigation system) 1050
- TECHNICAL PAPERS, Bell System, not published in this Journal 327-34, 577-82, 813-22, 1035-42, 1308-13, 1501-07

- TELEGRAPH**
 North Atlantic routes *map* 294
 transatlantic cable 2, 20, 26-27
- TELEGRAPH CONSTRUCTION AND MAINTENANCE CO., LTD.** 308
- TELEGRAPHIST'S EQUATIONS** *See* Generalized Telegraphist's Equations
- TELEPHONE EXCHANGE**
 model, statistics 939-64
- TEMPERATURE**
 North Atlantic Ocean 1077-86
 ocean bottom 1075-86
- TERMINAL(S)**
 carrier, P1 354, 373-75
 network, shortest connection 1389-1401
 Newfoundland-Nova Scotia link 227-29
 transatlantic telephone cable
 North Atlantic link 52-55
- TERRENCEVILLE, NEWFOUNDLAND** 11, 219, 232, 246, 248, 293, 295, 318-19, 322, 324; *map* 218, 300
- TEST(S), TESTING**
 biochemical oxygen demand 1098-1114
 carrier, P1 375
 electron tube, 6P12 186-88
 conduit, thin-walled 737-54
 repeater, flexible
 North Atlantic link 77-78, 94-96
- TEST SET**
 7F 389-90; *illus* 390
 conduit, thin-walled *illus* 739
- Tharp, Marie** 1093
- Theory of Curved Circular Waveguide Containing an Inhomogeneous Dielectric** (S. P. Morgan) 1209-51
- Thomas, J. F. P.**
 biographical material 346
Power-Feed System for the Newfoundland-Nova Scotia Link 277-92
- TIME OF DAY**, and radio transmission noise 624
- Title, R. S.** 1337
- TONAWANDA PLANT** (W. E. Co.) 107
- Townsend, Mark A.** 88-90
 biographical material 830
Cold Cathode Gas Tubes for Telephone Switching Systems 755-68
- TRAFFIC**
 demand 941
 engineering 940
 fluctuations 965-73
 measurement 939-64
- Transatlantic Communications—An Historical Resume** (M. J. Kelly, Sir G. Radley) 1-5
- TRANSATLANTIC RADIO TELEPHONE** 5
- TRANSATLANTIC TELEPHONE CABLE**
 cable, *see* Submarine Cable
 crosstalk 19-20
 echo 21
 facilities *block diagram* 10
 frequency characteristics 18, 24-26
 maintenance 21-23, 55-57, 235-41
map 8, 302
 net loss 18
 noise 19-20
 operating services 21-23
 performance 24-27
profile 304
 repeaters, *see* Repeater
 route selection 293-326
 service objectives 16
 signaling objectives 20-21
 submarine cable, *see* Submarine Cable
 system planning 15-24
 telegraph facilities 2, 20, 26-27
 telephone circuits 9
temperature profile 1083
 transmission objectives 16-18
- Transatlantic Telephone Cable System—Planning and Over-All Performance** (J. W. Emling, R. G. Griffith, R. J. Halsey, E. T. Mottram) 7-27
- TRANSDUCER**
 coupled-wave, problems 391
 electrohydraulic, J-7 711-36
 illus 717, 718
 actuating mechanism 719-24
cutaway section 716
 description 715-19
exploded view 717
 hydraulic characteristics 724-34
internal view 720
 ports *illus* 714
- See also* Vernier Resolver
- TRANSFORMER**, carrier, P1 368-69

- TRANSISTOR
4B, carrier, P1 355-56
4C, carrier, P1 355-56
carrier, P1 349-90
submarine cable prospects 3-4
twistor memory arrays 1333-36
- TRANSMISSION
carrier, P1 351-55
information, *see* Information Rate
radio
beyond the horizon
antenna size 639-40
experimental data 608-11
reflection theory 627-44
seasons 640-43
buildings 613-14
fog 602
fundamentals 593-626
ground wave 614-18
ionospheric 618-23
noise levels 623-24
rain 602
snow 602
trees 613-14
transatlantic telephone cable 16-18
- Transmission Aspects of Data Transmission Service Using Private Line Voice Telephone Channels* (P. Mertz, D. Mitchell) 1451-86
- TRANSMISSION LOSS
Newfoundland-Nova Scotia Link 229, 241
radio 593-97
earth, plane *diagrams* 598
line of sight 596-602
- TRANSEOCEANIC CABLE *See* Submarine Cable
- TRANSVERSE EQUALIZER *See* Equalizer
- TRAVELING-WAVE TUBE *See* Electron Tube
- TREES, and radio transmission 613-14
- Tretola, A.R. 1004
- TRUNK(s), TRUNKING
carriers 350
defined 941-42
- TUBE *See* Electron Tube
- TUBING *See* Copper Tubing
- Tucker, Rexford S.
biographical material 346
- System Design for the North Atlantic Link* 29-68
- Tukey, J. W. 576, 964
- TURBIDITY CURRENTS 1089-93
- TWISTOR 1319-40
bits (binary digits) 1336
switching time 1328
transistor powering 1333-36
- U**
- USAF *See* United States Air Force
- Ulrich, Werner
biographical material 1513
Non-Binary Error Correction Codes
1341-88
- Unger, Hans-Georg
biographical material 1318
Circular Electric Wave Transmission in a Dielectric-Coated Waveguide
1253-78
- Circular Electric Wave Transmission through Serpentine Bends* 1279-92
- Normal Mode Bends for Circular Electric Waves* 1292-1307
- UNITED STATES
submarine cable systems 13-14
- UNITED STATES AIR FORCE MISSILE TEST CENTER, submarine cable 190-92, 214
- V**
- Van Uitert, L. G. 448
- VAPOR, organic, contacts, electrical
activation 769-812
erosion 769-812
- Vasko, T. J. 1004
- Veazie, Edmund A.
biographical material 347
Electron Tubes for the Transatlantic Cable System 163-88
- Velorie, Harold S.
biographical material 1046
High-Voltage Conductivity-Modulated Silicon Rectifier 975-1004
- VERNIER RESOLVER
applications 1487-1500
design 1487-1500
output 1489
performance 1487-1500

VERNIER RESOLVER (*Cont.*)

- rotor lamination** *illus* 1492
- schematic diagram** 1490
- servo system** *illus* 1497
- stator lamination** *illus* 1491

VOCABULARY SIZE

- information rate** 499
- VOCODER** channel capacity 497
- VOLTAGE rectifier, solid state** 975
- Volz, A. H.** 1449

W

- Wakai, T. W.** 1499
- Walker, D. C.**
 - biographical material 347
 - Repeater Design for the Newfoundland-Nova Scotia Link* 245-76

WAR WORK *See* Military Commun.

Watling, R. G. 754

WASHINGTON, D. C.

- state capitals, shortest connection network 1389-1401; *illus* 1390

WAVE

circular

- bends, serpentine
 - transmission 1279-92
- modes, normal, bends 1292-1307
- waveguide, dielectric-coated
 - transmission 1253-78
- radio, path 600

See also Microwave

WAVEGUIDE

circular

- bends, modes, normal 1292-1307
- birefringence, effect 409-26
- curved, dielectric, inhomogeneous 1209-51
- modes, in gyromagnetic media 409-26
- propagation characteristics 409-26
- serpentine
 - wave, circular, transmission 1279-92

coupler, *see* Coupler

coupling

- attenuation 392
- coupler, *see* Coupler
- dielectric-coated, wave, circular, transmission 1253-78

Printed in U. S. A.

ferrite loaded, propagation characteristics 409

rectangular

- birefringence, effect 409-26
- modes, in gyromagnetic media 409-26

propagation characteristics 409-26

round, *see* Waveguide; circular

Weatherington, C. A. 495

Weissmann, Gerd F.

biographical material 830

Strength Requirements for Round Conduit 737-54

Welber, L. 1449

Welsby, V. G.

biographical material 347

Repeater Design for the Newfoundland-Nova Scotia Link 245-76

Wenny, D. H., Jr. 1337

Werner, J. K. 1449

WEST HAVEN, CONNECTICUT map 8

White, A. D. 768

WHITE PLAINS, NEW YORK map 8

Williams, I. V. 754

Winnicky, A. P. 512

WIRE(S)

magnetic, twistor 1319-40

WIRING, printed, *see* Printed Circuitry

Wittenberg, A. M. 768

Wooley, M. C.

biographical material 347

Repeater Design for the North Atlantic Link 69-101

WORDS

familiarity, and information rate 500

length, information rate .500

WRIGHT AIR DEVELOPMENT CENTER 1487, 1499

WRIGHTSVILLE BEACH, NORTH CAROLINA, test site 1115-21

Z

Zadeh, L. A. 1387

Zajac, E. E.

biographical material 1318

Dynamics and Kinematics of the Laying and Recovery of Submarine Cable 1129-1207

ZoBell, Claude E. 1126

THE BELL SYSTEM

Technical Journal

DEVOTED TO THE SCIENTIFIC AND ENGINEERING
ASPECTS OF ELECTRICAL COMMUNICATION

VOLUME XXXVI

JANUARY 1957

NUMBER 1

Transatlantic Communications — An Historical Resume MERVIN J. KELLY AND SIR GORDON RADLEY	1
Transatlantic Telephone Cable System—Planning and Over-All Performance E. T. MOTTRAM, R. J. HALSEY, J. W. EMLING AND R. G. GRIFFITH	7
System Design for the North Atlantic Link H. A. LEWIS, R. S. TUCKER, G. H. LOVELL AND J. M. FRASER	29
Repeater Design for the North Atlantic Link T. F. GLEICHMANN, A. H. LINCE, M. C. WOOLEY AND F. J. BRAGA	69
Repeater Production for the North Atlantic Link H. A. LAMB AND W. W. HEFFNER	103
Power Feed Equipment for the North Atlantic Link G. W. MESZAROS AND H. H. SPENCER	139
Electron Tubes for the Transatlantic Cable System J. O. McNALLY, G. H. METSON, E. A. VEAZIE AND M. F. HOLMES	163
Cable Design and Manufacture for the Transatlantic Submarine Cable System A. W. LEBERT, H. B. FISCHER AND M. C. BISKEBORN	189
System Design for the Newfoundland-Nova Scotia Link R. J. HALSEY AND J. F. BAMPTON	217
Repeater Design for the Newfoundland-Nova Scotia Link R. A. BROCKBANK, D. C. WALKER AND V. G. WELSBY	245
Power-Feed System for the Newfoundland-Nova Scotia Link J. F. P. THOMAS AND R. KELLY	277
Route Selection and Cable Laying for the Transatlantic Cable System J. S. JACK, CAPT. W. H. LEECH AND H. A. LEWIS	293
Bell System Technical Papers Not Published in This Journal	327
Recent Bell System Monographs	335
Contributors to This Issue	338
